

Serial No. 10/718,619

Attorney Docket No. 01-510

LISTING OF CLAIMS:

1. (Currently amended) An organic EL panel having a driving voltage waveform for a backward bias voltage, wherein the organic EL panel is comprised of a plurality of pixels, each of the plurality of pixels comprising an organic layer disposed between a lower electrode and an upper electrode, wherein

the plurality of pixels have a self-healing property for repairing themselves by an application of the backward bias voltage equal to or less than a first withstand voltage of the organic layer in a voltage application condition at a time of use,

the organic layer includes a light-emitting layer disposed between the lower electrode and the upper electrode,

~~the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer,~~

~~the electric field intensity of the organic layer is 3×10^6 V/cm or greater,~~

a second withstand voltage per unit thickness of the organic layer is 3×10^6 V/cm or greater, the second withstand voltage being calculated by dividing the first withstand voltage by the thickness of the organic layer.

the backward bias voltage is represented as V_r ,

the thickness of the upper electrodes is represented as D_a ,

the ratio V_r/D_a between V_r and D_a is represented as X_a , and

X_a is 2.2×10^6 V/cm or greater.

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2. (Canceled)

3. (Withdrawn - Currently amended) The organic EL panel of claim 1, further comprising a resin protective film comprising a resin disposed on the upper electrode to cover the plurality of pixels, the resin protective film including oxygen as a constituent element, whereby the resin protective film decomposes and releases a low molecular weight substance including oxygen when the lower and upper electrode short-circuit and when the backward bias voltage equal to or less than the first withstand voltage of the organic layer in the voltage application condition at the time of use is applied.

4. (Withdrawn) The organic EL panel of claim 3, wherein the upper electrode and the organic layer are successively laminated on the lower electrode.

5. (Withdrawn) The organic EL display device of claim 3, wherein the resin protective film comprises a silicon resin.

6. (Withdrawn) The organic EL display device of claim 3, wherein the resin protective film comprises a fluoro resin.

7. (Withdrawn) The organic EL display device of claim 3, further comprising an inorganic protective film comprised of inorganic matter, wherein the inorganic protective film is

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intervened between the resin protective film and the upper electrode, is formed by atomic layer epitaxy and the film thickness thereof is 200 nm or less.

8. (Withdrawn) The organic EL display device of claim 3, further comprising a gas-trapping getter inserted between the upper electrode and the resin protective film.

9. (Withdrawn) The organic EL display device of claim 3, further comprising a laminate film comprising metal foil or a laminate sheet formed by adhering together a metal film and resin films disposed on the resin protective film, wherein the laminate film is for shielding the plurality of pixels and the resin protective film from outside air.

10. (Withdrawn) The organic EL display device of claim 3, wherein the resin protective film comprises a desiccant mixed therein.

11. (Currently amended) The organic EL panel of claim 1, wherein the first withstand voltage of the organic layer is determined by driving the organic EL panel for 1 minute or less in the voltage application condition at the time of use.

12. (Currently amended) The organic EL panel of claim 1, wherein the backward bias voltage is 1/2 of, or less than 1/2 of, the first withstand voltage of the organic layer.

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13. (Canceled)

14. (Currently amended) The organic EL panel of claim 1, wherein the electric field ~~intensity~~ second withstand voltage of the organic layer excluding a conductive organic film from the organic layer is 3.4×10^6 V/cm or greater.

15. (Canceled)

16 (Previously presented) The organic EL panel of claim 1, wherein the thickness Da of the upper electrodes is 100 nm or less.

17-19 (Canceled)

20. (Previously presented) The organic EL panel of claim 1, wherein the plurality of pixels are sealed with an inert gas including a first gas that increases susceptibility to burn, and a concentration of the first gas in the inert gas is 0.5% or more.

21. (Original) The organic EL panel of claim 1, wherein an average surface roughness Ra is 2 nm or less as the surface roughness of the lower electrode.

22-33 (Canceled)

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34. (Withdrawn) An organic EL display device comprising:

a pixel that comprises a lower electrode, an organic layer including a light-emitting layer and an upper electrode successively laminated; and

a resin protective film comprising a resin disposed on the upper electrodes so as to cover the pixel, the resin protective film including oxygen as a constituent element, whereby the resin protective film decomposes and releases a low molecular weight substance including oxygen when the lower and upper electrodes short-circuit and when a backward bias voltage equal to or less than a withstand voltage of the organic layer in a voltage application condition at the time of use is applied.

35. (Withdrawn) The organic EL display device of claim 34, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer is represented as D_y , and the ratio V_r/D_y between V_r and D_y is represented as Y_a , Y_a is 1.2×10^6 V/cm or greater and 2.2×10^6 V/cm or less.

36. (Withdrawn) The organic EL display device of claim 34, wherein when the backward bias voltage is represented as V_r , the thickness of the organic layer excluding a conductive organic film is represented as D_y' , and the ratio V_r/D_y' between V_r and D_y' is represented as Y_a' , Y_a' is 1.4×10^6 V/cm or greater and 2.4×10^6 V/cm or less.

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37. (Currently amended) An organic EL panel having a driving voltage waveform for a backward bias voltage, wherein

the organic EL panel is comprised of a plurality of pixels, each of the plurality of pixels comprising an organic layer disposed between a lower electrode and an upper electrode,

~~wherein the plurality of pixels have a self-healing property for repairing themselves by an application of the backward bias voltage equal to or less than a withstand voltage of the organic layer in a voltage application condition at a time of use,~~

the organic layer includes a light-emitting layer disposed between the lower electrode and the upper electrode,

~~the withstand voltage of the organic layer is expressed as an electric field intensity per unit thickness of the organic layer,~~

~~the electric field intensity of the organic layer is 3×10^6 V/cm or greater,~~

a second withstand voltage per unit thickness of the organic layer is 3×10^6 V/cm or greater, the second withstand voltage being calculated by dividing the first withstand voltage by the thickness of the organic layer,

the backward bias voltage is represented as V_r ,

the thickness of the organic layer is represented as D_y ,

the ratio V_r/D_y between V_r and D_y is represented as ~~Y_a~~ and Y_a ,

Y_a is 2×10^6 V/cm or greater and 2.2×10^6 V/cm or ~~less~~ less,

the thickness of the upper electrode is represented as D_a , and

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the ratio V_r/D_a between V_r and V_a is represented as X_a , and X_a is 2.2×10^6 V/cm or greater.

38. (Currently amended) The organic EL panel of claim 37, wherein the first withstand voltage of the organic layer is determined by driving the organic EL panel for 1 minute or less in the voltage application condition at the time of use.

39. (Currently amended) The organic EL panel of claim 37, wherein the backward bias voltage is 1/2 of, or less than 1/2 of, the first withstand voltage of the organic layer.

40. (Currently amended) The organic EL panel of claim 37, wherein the electric field intensity-second withstand voltage of the organic layer excluding a conductive organic film from the organic layer is 3.4×10^6 V/cm or greater.

41. (Previously presented) The organic EL panel of claim 37, wherein the thickness of the organic layer excluding a conductive organic film is represented as D_y' ,

the ratio V_r/D_y' between V_r and D_y' is represented as Y_a' , and

Y_a' is 1.4×10^6 V/cm or greater and 2.4×10^6 V/cm or less.

42. (Previously presented) The organic EL panel of claim 37, wherein

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the plurality of pixels are sealed with an inert gas including a first gas that increases susceptibility to burn, and

a concentration of the first gas in the inert gas is 0.5% or more.

43. (Previously presented) The organic EL panel of claim 37, wherein an average surface roughness Ra is 2 nm or less as the surface roughness of the lower electrode.